

A NEW SPECIES OF  
MACHAERANTHERA SECTION PSILACTIS

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***Machaeranthera arizonica*** Jackson & Johnson, sp. nov.

Herba perennis 15-30 dm alta, glandularo-puberulenta (pilis glandularibus saepe trichomatibus longioribus eglandularibus intermixtis); foliis sessilibus, laminis lanceolatis, inaequaliter incisive dentatis crispatisque; involucris 4-9-7.1 mm altis; phyllariis 35-62, lanceolatis, 4.2-4.7 mm longis; radiis 19-34, 6.8-10.8 mm longis, 1.7-2.2 mm latis; disci corollis 41-111, 3.4-5.2 mm longis; pappis florum discorum 33-51, 2.8-3.3 mm longis; pappus eorum radiorum nullis.

Perennial herb from a strongly developed taproot, 15-30 dm tall, glandular-puberulent throughout with occasional intermixed non-glandular hairs; many branches from the somewhat woody base; leaves sessile, sometimes clasping at the base, alternate, crisped, irregularly incisely dentate, the lower ones more deeply so; heads on short peduncles with slightly reduced leaves; involucre 4.9-7.1 mm high; phyllaries in 4-5 series, lanceolate with green tips, the scarious margins of the outer series white, the inner ones purple; rays 19-34, 6.8-10.9 mm long, 1.7-2.2 mm wide; disc corollas 47-111, 3.4-5.2 mm long; pappus one series of 33-51 bristles, 2.8-3.3 mm long; achenes ca. 2 mm long. Chromosome number  $n=5$ .

TYPE. ARIZONA: PIMA COUNTY; Organ Pipe Cactus National Monument, low, rocky hillsides and sandy soil around Quitobaquito Springs, 31 March 1962, *R. C. Jackson & R. R. Johnson 3043-1*, KANU (Fig. 1); Isotype at ARIZ.

Additional specimens in the University of Arizona Herbarium from the type locality: 5 March 1940, *Benson 9934*; 5 March 1940, *Peebles 14560*; 17 April 1952, *Parker 7994*; 28 April 1939, *Nichols s.n.*; 27 November 1939, *Harbison 26176*.

The closest relatives of *M. arizonica* appear to be *M. crispa* (Brandege) Turner & Horne and *M. arida* Turner & Horne.

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The second species is known from two localities in Baja California del Sur and the third occurs in the northwestern part of Sonora and the southern parts of California, Arizona, and Nevada.

The springs at Quitobaquito, the type locality of *M. arizonica*, are fed from water forced through rock fissures to



Plate 1370

Figure 1. Photograph of the holotype of *Machaeranthera* (*Psilactis*) *arizonica* Jackson & Johnson.

the surface. The desert pupfish lives in these waters and is found also in the Sonoyta River, about one mile south, and in the Lower Colorado River, an indication that at some time in the past the springs flowed to the river and the river to the Gulf of California.<sup>2</sup> This could have provided a migration route from the general locality of *M. crispa*, perhaps the ancestral or a closely related stock of *M. arizonica*, to Quitobaquito along more a mesic habitat. *M. crispa* and *M. arida*, however, appear to occupy drier habitats than *M. arizonica* at the present time.

*Machaeranthera arizonica* is somewhat intermediate morphologically for characters of *M. crispa* and *M. arida* (Table 1) and may occupy the same position phylogenetically since it is still biennial or perennial and occupies a somewhat more mesic habitat than the annual *M. arida*. Artificial crosses between *arida* and *arizonica* yielded seed, but the F<sub>1</sub> hybrids have not been grown yet. Both species are self-sterile.

Turner and Horne (1964) combined *Psilactis* with *Machaeranthera*, proposing *Psilactis* as a series of the latter genus. This proposal was based on the break down of the diagnostic character of *Psilactis*, namely, the absence of pappus bristles on the ray achenes. One and possibly two species show variation for this character. In addition, a preliminary report on hybridization between *Psilactis* and *Machaeranthera* (Jackson, 1962) added weight to the proposed change. The presence or absence of a ray pappus as a diagnostic generic character does, indeed, seem a poor one for separating the two genera. The two taxa are genetically related as shown by the production of a hybrid which was, nonetheless, rather highly sterile. The degree of relationship and how this should weigh on the question of merging the taxa might be answered better when a detailed cytogenetic analysis of inter- and intrataxon hybrids has been completed. There are nevertheless some floral and leaf char-

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<sup>2</sup>Information supplied in "A Guide to the 40-Mile Scenic Loop Drive [of] Organ Pipe Cactus National Monument" by U.S. National Park Service.

Table 1. Morphological comparisons of some floral characters of *Machaeranthera arida*, *M. arizonica*, and *M. crispa* \*

Characters	<i>M. arida</i>		<i>M. arizonica</i>		<i>M. crispa</i>	
	$\bar{X}$	range	$\bar{X}$	range	$\bar{X}$	range
Disc Flower						
a) no. per head	52.3	(41-62)	80.4	(41-111)	—	(75-100)
b) corolla length (mm)	3.5	(2.8-4.4)	4.1	(3.4-5.2)	—	(4-6)
c) no. pappus bristles	28.6	(21-34)	41	(33-51)	—	(c. 30)
d) pappus length (mm)	2.6	(2.2-3.3)	3.0	(2.8-3.3)	—	(2.8-3.4)
Ray Flower						
a) no. per head	23	(18-29)	29.4	(19-34)	—	(30-40)
b) length (mm)	7.9	(6.6-9.2)	9.0	(6.8-10.8)	—	(6-8)
c) width (mm)	1.6	(1.3-1.9)	2.0	(1.7-2.2)	—	(0.8-1.0)

\* Data for ranges in *M. crispa* are from Turner & Horne (1964). Data for the other taxa were from plants grown in the greenhouse at the same time. Source of *M. arida* was seed collected at Agua Caliente, Maricopa County, Arizona. Seed of *M. arizonica* was obtained from the type locality. Fourteen to 18 plants were used for the average and range data for *M. arida* and *M. arizonica*.

acters that effectively set off *Psilactis* from *Machaeranthera*, either as a distinct genus or as a subgeneric taxon.

On morphological grounds, *Machaeranthera parviflora* should be placed in series *Psilactis* also; it has the same chromosome number ( $n=5$ ; Jackson 5241, KANU) as its other close relatives, *M. arida*, *M. coulteri*, *M. crispa*, and *M. arizonica*.

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#### LITERATURE CITED

- TURNER, B. L. and D. HORNE. 1964. Taxonomy of *Machaeranthera* sect. *Psilactis* (Compositae-Astereae). *Brittonia* 16:316-331.  
JACKSON, R. C. 1962. Intergeneric hybridization between *Psilactis* and *Machaeranthera*. *Amer. Jour. Bot.* 49:676. (Abstract).

### ADDITIONS TO THE VASCULAR FLORA OF OKLAHOMA — II

It is a tendency for some botanists to think of the vascular flora of our area as rather thoroughly collected until for some reason they attempt to delineate the distribution of some species. Often when the specimens housed in our herbaria are examined, two conditions are encountered. (1) Although the species is often a rather common one, only a few specimens are available. (2) Again, sometimes there may be several folders of specimens, but all from a few locations. The interest of more and more of our botanists today does not take them to the field, yet much general collecting is still to be done. I feel that the species discussed in this brief paper offer some support to these contentions. Although they are thought not to have been previously reported for the state, they occur in rather common habitats (old fields, rocky roadsides, sand dunes, etc.) and probably have been members of our flora for a long time. We wish to express our thanks to Betty Weisenhunt, who helped with the species of *Schrankia*. All specimens cited were collected by John and Constance Taylor unless otherwise indicated, and are presently located at the Bebb Herbarium, Norman.

*Ophioglossum crotalophoroides* Walt. The genus *Ophioglossum* has been known in our flora by the one species *O. engelmannii* Prantl for over 30 years. Now we have *O. cro-*